

Appl. No. 10/810,728
Amdt. Dated August 9, 2006
Reply to Office Action of May 10, 2006

Attorney Docket No. 81872.0060
Customer No. 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A surface acoustic wave apparatus formed by mounting a surface acoustic wave element to a circuit board, wherein:

said surface acoustic wave element includes a piezoelectric substrate, an electrode, formed on one main surface of said piezoelectric substrate, to be at a ground potential, and an IDT electrode formed on said one main surface of said piezoelectric substrate;

said IDT electrode is an electrode comprising paired comb-teeth-shaped electrodes, each having plural electrode fingers, oppositely placed in such a manner that the electrode fingers of one comb-teeth-shaped electrode are positioned between the electrode fingers of the other comb-teeth-shaped electrode;

either of said comb-teeth-shaped electrodes forming said IDT electrode is connected to said electrode to be at the ground potential via a resistor formed entirely on said one main surface of said piezoelectric substrate; and

said resistor is made of a semiconductor.

2. (Original) The surface acoustic wave apparatus according to Claim 1, wherein:

said semiconductor is a 14 group semiconductor.

3. (Original) The surface acoustic wave apparatus according to Claim 2, wherein:

said 14 group semiconductor is silicon.

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4. (Original) The surface acoustic wave apparatus according to Claim 3,
wherein:

said silicon includes at least one element selected from B, Al, Ga, In, P,
As, and Sb as a dopant.

5. (Original) The surface acoustic wave apparatus according to Claim 1,
wherein:

said semiconductor is a 12 - 16 group semiconductor.

6. (Original) The surface acoustic wave apparatus according to Claim 1,
wherein:

said semiconductor is an oxide semiconductor.

7. (Original) The surface acoustic wave apparatus according to Claim 1,
wherein:

a resistance value between the comb-teeth-shaped electrode to be at a
signal potential in said IDT electrode and said electrode to be at the ground
potential is between 2 k Ω and 30 M Ω both inclusive.

8. (Original) The surface acoustic wave apparatus according to Claim 1,
wherein:

a resistance value between the comb-teeth-shaped electrode to be at a
signal potential in said IDT electrode and said electrode to be at the ground
potential is between 20 k Ω and 30 M Ω both inclusive.

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9. (Original) A communications device, comprising:
a switching circuit or a duplexer circuit, connected to an antenna terminal, to switch transmission to reception and vice versa;
a power amplifier circuit, connected to said switching circuit or said duplexer circuit, to amplify a transmission signal; and
a filter, inserted in a signal path from said power amplifier circuit to said antenna terminal, to attenuate an unwanted wave component in the transmission signal,
wherein said filter is formed by using the surface acoustic wave apparatus according to Claim 1.

10. (Currently amended) A surface acoustic wave apparatus formed by mounting a surface acoustic wave element to a circuit board, wherein:
said surface acoustic wave element includes a piezoelectric substrate and an IDT electrode formed on one main surface of said piezoelectric substrate;
said IDT electrode is an electrode comprising paired comb-teeth-shaped electrodes, each having plural electrode fingers, oppositely placed in such a manner that the electrode fingers of one comb-teeth-shaped electrode are positioned between the electrode fingers of the other comb-teeth-shaped electrode;
said paired comb-teeth-shaped electrodes forming said IDT electrode are connected to each other via a resistor formed entirely on said one main surface of said piezoelectric substrate; and
said resistor is made of a semiconductor.

11. (Original) The surface acoustic wave apparatus according to Claim 10, wherein:
said semiconductor is a 14 group semiconductor.

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12. (Original) The surface acoustic wave apparatus according to Claim 11, wherein:

said 14 group semiconductor is silicon.

13. (Original) The surface acoustic wave apparatus according to Claim 12, wherein:

said silicon includes, as a dopant, at least one element selected from B, Sb, Ti, and Al.

14. (Original) The surface acoustic wave apparatus according to Claim 10, wherein:

said semiconductor is a 12 – 16 group semiconductor.

15. (Original) The surface acoustic wave apparatus according to Claim 10, wherein:

said semiconductor is an oxide semiconductor.

16. (Previously Presented) The surface acoustic wave apparatus according to Claim 15, wherein:

said oxide semiconductor is at least one kind selected from TiO_2 , CuO , Cu_2O , CuAlO_2 , NiO , and Nb_2O_3 .

17. (Original) The surface acoustic wave apparatus according to Claim 16, wherein:

said TiO_2 includes at least one element selected from Sb, F, Cl, N, Cr, Pd, Ta, Ni, and Cu as a dopant.

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18. (Original) The surface acoustic wave apparatus according to Claim 10, wherein:

a resistance value between said paired comb-teeth-shaped electrodes forming said IDT electrode is between 20 k Ω and 30 M Ω both inclusive.

19. (Original) A communications device, comprising:

a switching circuit or a duplexer circuit, connected to an antenna terminal, to switch transmission to reception and vice versa;

a power amplifier circuit, connected to said switching circuit or said duplexer circuit, to amplify a transmission signal; and

a filter, inserted in a signal path from said power amplifier circuit to said antenna terminal, to attenuate an unwanted wave component in the transmission signal,

wherein said filter is formed by using the surface acoustic wave apparatus according to Claim 10.

20. (New) The surface acoustic wave apparatus according to Claim 1, wherein:

the electrode, formed on the one main surface of said piezoelectric substrate, to be at a ground potential is an annular electrode surrounding the IDT electrode and the resistor is formed inside of the annular electrode.

21. (New) The surface acoustic wave apparatus according to Claim 10, wherein:

the resistor formed on said one main surface of said piezoelectric substrate is a passivation film formed on the paired comb-teeth-shaped electrodes forming the IDT electrode.